PATİKA.DEV & PAYCORE JAVA SPRING BOOTCAMP HOMEWORK 2

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1 – IOC and DI means ?

IoC(Inversion of Control) is a principle aims to create objects with loose dependency to each other. It is respınsible for the lifecycle of objects. When there is an interface injection to a class that is using IOC , interface methods becomes accessible to class.This way class with IOC only knows the methods of interfaces. Advantages of inversion of control are:

- Loose coupled classes
- Easy unit testing
- Managability
- Modularity
- Easy transmission between different implementations

With dependency injection , instead of using objects that would create dependencies, you inject objects extarnally to system to minimize dependancies. Using DI would also increase the correctness of the unit tests as well as ease up the writing of tests.

2 – Spring Bean Scopes ?

There are six types of scopes. These scopes are :

- Singleton
- Prototype
- Request
- Session
- Application
- Websocket

Request,session,application, and websocket are only available in a web-aware application.

Singleton Scope : When a bean created in singleton scope, the container creates a single instance of that bean. All requests in this bean name will return the same object. Also any change in the object will automatically change all the referenced parts. This scope is default, unless any other scope has been called.

Prototype Scope : Bean with this scope will create different instance every time it is requested from container.

Request Scope : It is a web aware scope that creates an instance when a HTTP request has been made.

Session Scope : It is also a web aware scope that works in a similar way , creates instance when a HTTP session created.

Global-Session Scope : Defines a global HTTP session.

Application Scope : Injects a global bean to web applications.

Websocket : Creates a bean for every websocket connection.

3 – What does @SpringBootApplication do ?

It is a class that defines that this class is a configuration class, with @EnableAutoConfiguration and @ComponentScan annotation triggers the automatic configuration and scanning.

4 – What is Spring AOP ? Where and How to use it ?

Aspect oriented programming is one of the key componenets of the Spring Framework. It entails breaking down program into distinct parts called concerns. Includes concept of cross-cutting concerns that are separate from business logic. AOP module provides interceptors to intercept an application. Some related terms for AOP is Aspect,Join point,Advice, Pointcut, Introduction, Target Object, Weaving.

5 – What is Singleton and where to use it ?

When a bean created in singleton scope, the container creates a single instance of that bean. All requests in this bean name will return the same object. Also any change in the object will automatically change all the referenced parts. This scope is default, unless any other scope has been called.It would be used for stateless beans.

6 – What is Spring Boot Actuator and Where to use it ?

It would help our spring boot application to get info about working spring boot application with endpoint. With endpoint usage of actuator we can learn about program:

- **Autoconfig** : All autoconfigs defined.
- **Beans** : Shows all the beans managed by Spring.
- **Dump** : For thread dumping
- **Env** : Shows Springs ConfigurableEnvironment values
- **Health** : Shows program health
- **Info** : Shows program information
- **Loggers** : Shows log information in the program
- **Mappings** : Shows the values that are used @RequestMapping
- **Trace** : Lists last 100 HTTP requests

7 - What is the primary difference between Spring and Spring Boot ?

Spring Boot is built on top of the Spring Framework. It provides a faster and simpler way to set up, configure and run web-based applications. Spring boot framework is widely used for REST APIs. Spring boot has a primary feature Autoconfiguration, it automatically configures the classes based on the requirement. Helps create a stand-alone application with less configuration. Spring boot offers embedded server such as Jetty and Tomcat, as well as in-memory database such as H2DB. Spring boot also has the concept of starter in pom.xml file that internally takes care of dependencies JARs based on Spring Boot requirement.

8 – Why to use VCS ?

Version control system or VCS is a system concept that makes it possible to keep track of changes, and keep every team member on the current version. It would also help the team develop and ship products faster. Helps team collaborate, accelerates delivery,improves visibility.Types of VCS are:

- HelixCore
- Git
- SVN
- ClearCase
- Mercurial
- TFS

9 – What are SOLID Principles ? Give sample usages in Java ?

Single Responsibility Principle

A class can only be changed for only one purpose, and that is the given responsibility to the class. So when there is a class, there should be one thing its responsible for.

Open-closed principle

A class or a function should keep its behaviour and new specialities can be added.

Liskov substitution principle

When there is a sub class, without making any changes super classes should be able to substituted.

Interface Segragation principle

Interfaces should be splitted, instead of every method filled into one interface.

Dependency inversion principle

Loose coupling is preferred. Dependant class structure is not preferred.

10 - What is RAD model ?

RAD stands for Rapid Application Development. It is used for creating a stand-alone Spring-based application that needs just minimal configurations.

11 - What is Spring Boot starter ? How is it useful ?

Spring boot starters are built to addresss dependency management issues. Starter POMs are a set of convenient dependency descriptors that you can include in your application. Starters allow us to add jars in classpath. There can also be third party starters included in projects.

12 – What is Caching ? How can we achieve caching in Spring Boot ?

Caching is a mechanism to improve performance of the system. It is temporary memory between the program and persistent database. Generally master data, list of products, frequently used and mostly static queries are considered good candidates for caching.There are four types of caching: In-memory caching;Database caching; Web server caching; CDN caching.In Spring boot there are annotations that would achieve caching they are: @EnableCaching; @Cacheable; @CachePut; @CacheEvict; @Caching. Also there are caching engines that can be implemented to spring boot projects.

13 – What & How & Where & Why to logging ?

In Java, logging is an API that provides the ability to trace out the arrors of the applications. When an application generates logging call, LogRecord records the events. It provides the complete tracing information of the program. It records critical failures.

14 - What is Swagger? Have you implemented it using Spring Boot?

Swagger is an interface description language for describing REST APIs to JSON format. To use swagger with spring boot , there is a tool called SpringFox. Also in XML file there is a dependency to add to enable swagger with @EnableSwagger2 annotation.